

migan 

Large Format Numeric LED Display with CANopen Interface

User manual



FEMA
ELECTRÓNICA®

Distribuidor en España :

FEMA ELECTRÓNICA, SA
Pol. Ind. Santiga – Altimira 14 (T14 N2)
08210 Barberà del Vallès – BARCELONA
Tel. 93.72.96004 – info@fema.es
Fax 93.729.6003 – www.fema.es

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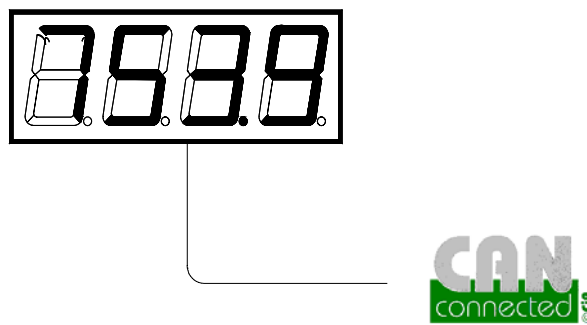
1 General

The large display is universally usable as production display or information panel.

The modular design permits cost-effective models in various sizes, with various font sizes and number of digits.

Integration into systems can therefore be made simply and without difficulties.

2 Application example



2.1 Device configuration

Font size:

☐ 60 mm ☐ 100 mm ☐ 150 mm ☐ 200 mm ☐ 250 mm

Number per lines:

Number of digits per line:

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15

LED color:

☐ red ☐ green ☐ yellow

Dimension indication:

Line 1: _____ Line 5: _____

Line 2: _____ Line 6: _____

Line 3: _____ Line 7: _____

Line 4: _____ Line 8: _____

View:

☐ single sided ☐ double sided

Operating voltage:

☐ 230 V / 50 Hz ☐ 110 V / 60 Hz ☐ 24 V DC

Type of protection:

☐ IP54 ☐ IP65

Temperature range:

☐ 0...+50 °C ☐ -25...+50 °C

Housing dimension: _____ x _____ x _____ mm

Housing color: RAL _____

Housing material:

- ☐ Aluminium profile housing
- ☐ Stainless steel housing
- ☐ Sheet panel housing

CANopen interface

Pre-adjustments at delivery:

Baud rate:

☐ 20 kBaud	☐ 50 kBaud	☐ 100 kBaud	☐ 125 kBaud
☐ 250 kBaud	☐ 500 kBaud	☐ 800 kBaud	☐ 1000 kBaud

Device address (Node-ID): _____Hex

3 Technical Information

Total specification

Display type:	LED, 7-Segment
Font size:	60 mm, 100 mm, 150 mm, 200 mm, 250 mm
Number of digits:	2 to 15 digits
LED color:	red, green, yellow
Character set:	see chapter "Displayable characters"
View:	single or double sided
Interface:	CAN
Protocol:	CANopen, DS301, Version 4.02
Baud rate:	10 / 20 / 50 / 125 / 250 / 500 / 800 / 1000 kBaud
Addresses:	1...127 _D
Operating voltage:	230 V / 50 Hz, 110 V / 60 Hz or 24 VDC
Power input:	60 mm per digit approx. 1.3 W 100 mm per digit approx. 1.6 W 150 mm per digit approx. 3.2 W 200 mm per digit approx. 4.2 W 250 mm per digit approx. 6.1 W
Housing:	Industrial version, aluminium powder coated
Housing size:	see chapters "Device configuration" and "Housing dimensions"
Mounting:	Joint installation, hanging installation, mounting angle for wall installation
Protection:	IP54 or IP65
Operating temperature:	0 to +50 °C (optional -25...+50 °C)
Storage temperature:	-25 to +70 °C

3.1 Notes for the start-up

- When putting on the power supply, the following sequence has to be observed:
 - Connect the power supply cable to the display.
 - Connect the power supply cable to the power supply.
- When disconnecting the power supply, the following sequence has to be observed:
 - Disconnect the power supply cable from the power supply.
 - Disconnect the power supply cable from the display.

3.2 System or device start

During the boot up process, the large display carries out internal memory and function tests.

The following parameters (no significance for CANopen devices) appear on the large display:

- Baud rate
- Parity
- Address

3.3 CANopen Interface

The **migan CAN** is an expanded version of the **migan SI** (with serial interface)..

The **miface CAN/RS** interface has been integrated into the display unit to this end. It has a CAN connection and serves for outputting of serial frames. These are transmitted (via RS485) to the MIGAN internally.

The following settings (factory default settings – do not change) are mandatory for communication between the MIGAN control PCB and the CANopen interface:

MIGAN Control PCB:

HEX Switch	S1	S2	S3
Status	1	0	B

MIFACE CAN/RS PCB:

DIP Switches RS (S2)	1	2	3	4	5	6	7	8	9	10
Status (1=ON, 0=OFF)	1	1	0	0	0	0	0	0	0	0

3.3.1 General Specifications miface CAN/RS

<u>Interface 1:</u>	CANopen per CIA standard DS301, V4.02
Bit rate:	10 to 1000 kBit/s (DIP switch)
Node ID:	1 to 127 (DIP switch)
PDOs:	1 receive PDO, 1 transmit PDO
PDO linking:	Yes (COB IDs for utilised PDOs can be adjusted via SDO)
PDO mapping:	Fixed
Node guarding:	Yes
Heartbeat:	Yes
<u>Interface 2:</u>	RS interface (permanently integrated into the MIGAN!)
Baud rate::	9600 Baud
Data width:	8 Bit
Parity:	no
Stop bits:	1

3.3.2 CANopen Protocol

The interface is driven via the CANopen interface as defined in CIA DS301, V4.02 (CAN in Automation e.V., Erlangen, Germany).

The protocols integrated into the device are described briefly below.

3.3.2.1 NMT Frames

	COB ID	B.1	B.2	B.3	B.4	B.5	B.6	B.7	B.8
Start remote node	000 _h	1	0 / node ID	-	-	-	-	-	-
Stop remote node	000 _h	2	0 / node ID	-	-	-	-	-	-
Enter pre-operational state	000 _h	128	0 / node ID	-	-	-	-	-	-
Reset node	000 _h	129	0 / node ID	-	-	-	-	-	-
Reset communication	000 _h	130	0 / node ID	-	-	-	-	-	-

All CANopen nodes are in one of the following operating states: "INITIALISATION", "PRE-OPERATIONAL", "OPERATIONAL" or "STOPPED".

After power-up, the INITIALISATION state is executed and entries in the object index are set to their default values.

Either all communications-specific entries, or only those included in the object index (1000_h - 1FFF_h), can be reset to their default values at any time with the help of the "reset node" and "reset communication" commands.

The device then enters the "PRE-OPERATIONAL" state.

The device is switched to the OPERATIONAL state after issuing the "start remote node" command.

The device can be switched to the stopped state through use of the "stop remote node" command.

Return to the PRE-OPERATIONAL state is made possible with the "enter pre-operational state" command.

3.3.2.2 Nodeguard Frame

	COB ID	B.1	B.2	B.3	B.4	B.5	B.6	B.7	B.8
Receive	700 _h + node ID RTR=1 DLC=1	-	-	-	-	-	-	-	-
Response	700 _h + node ID RTR=0 DLC=1	128 x toggle bit (0 or 1) + current operating state: 4: STOPPED 5: OPERATIONAL 127: PRE-OPERATIONAL	-	-	-	-	-	-	-

The “nodeguard” frame may only be used when “heartbeat” is inactive (“producer heartbeat time” = object 1017_h = 0).

When “life-guarding” is activated (“guard time” = object 100C_h > 0 and “life time factor” = object 100D_h > 0), a timer is started each time a nodeguard request occurs, which automatically switches the device to the PRE-OPERATIONAL state after “life time” has elapsed (“guard time” x “life time factor” ms), if the next nodeguard request is not received on time.

3.3.2.3 Heartbeat Frame

	COB ID	B.1	B.2	B.3	B.4	B.5	B.6	B.7	B.8
Response	700 _h + node ID RTR=0 DLC=1	Current operating state: 0: BOOTUP 4: STOPPED 5: OPERATIONAL 127: PRE-OPERATIONAL	-	-	-	-	-	-	-

The “boot-up” frame is transmitted after the device is switched on (operating state = “BOOTUP”).

After selecting the setting “producer heartbeat time” = object 1017_h (unit of measure: ms), the device starts transmitting the heartbeat frame in a cyclical fashion.

3.3.2.4 SDO Frames

	COB ID	B.1	B.2	B.3	B.4	B.5	B.6	B.7	B.8
"Initiate download request"	600 _h + node ID	22 _h or 23 _h + *	Index - LOW	Index - HIGH	Subindex	D0 (LSB)	D1	D2	D3 (MSB)
"Initiate download response"	580 _h + node ID	60 _h	Index - LOW	Index - HIGH	Subindex	0	0	0	0
"Initiate upload request"	600 _h + node ID	40 _h	Index - LOW	Index - HIGH	Subindex	0	0	0	0
"Initiate upload response"	580 _h + node ID	43 _h + *	Index - LOW	Index - HIGH	Subindex	D0 (LSB)	D1	D2	D3 (MSB)
"Abort domain transfer" (receive SDO)	600 _h + node ID	80 _h	Index - LOW	Index - HIGH	Subindex	Additional code	0	Error code	Error class
"Abort domain transfer" (send SDO)	580 _h + node ID	80 _h	Index - LOW	Index - HIGH	Subindex	Additional code	0	Error code	Error class

* 4 times "number of unused data bytes"

The object index of all CANopen nodes can be accessed with the help of the SDO frame.

3.3.2.5 Receive PDO Frame

	COB ID	B.1	B.2	B.3	B.4	B.5	B.6	B.7	B.8
RPDO1	200 _h + node ID	RS send data 1	RS send data 2	RS send data 3	RS send data 4	RS send data 5	RS send data 6	RS send data 7	RS send data 8

RPDO1 is mapped to object 2000_h, subindex 1 through 8.

RPDO1 must be transmitted to the interface (repeatedly), in order to generate an RS send frame.

3.3.2.6 Transmit PDO Frame

	COB ID	B.1	B.2	B.3	B.4	B.5	B.6	B.7	B.8
TPDO1	180 _h + node ID	RS receive data 1	RS receive data 2	RS receive data 3	RS receive data 4	RS receive data 5	RS receive data 6	RS receive data 7	RS receive data 8

TPDO1 is mapped to object 2001_h, subindex 1 through 8.

TPDO1 is (repeatedly) transmitted from the interface after an RS frame has been received.

3.3.3 Transmit RS Data Frame (CAN -> RS = MIGAN)

Receive PDO 1 (object 2000_h, subindex 1 through 8)

Byte	Function
1	Function byte: • Bit 7: end bit • Bits 6 ... 5: reserved (=0) • Bit 4: toggle bit • Bit 3: reserved (=0) • Bits 2 ... 0: sub-frame length
2	Sub-frame byte 1
3	Sub-frame byte 2
4	Sub-frame byte 3
5	Sub-frame byte 4
6	Sub-frame byte 5
7	Sub-frame byte 6
8	Sub-frame byte 7

Toggle Bit:

Each time the toggle bit is changed, the current sub-frame is added to the end of the transmit buffer.

End Bit:

- = 0: Sub-frames are accumulated.
- = 1: Accumulated sub-frames are transmitted (including the sub-frame which has just been transferred if the toggle bit has also been changed).

The transmit buffer is cleared after transmission has been completed (in order to be able to store new sub-frames), and the end bit is set to 0 (in order to be able to detect the end of the transmit procedure via SDO).

Sub-Frame Length:

Length of the transferred RS sub-frame

Sub-Frame Bytes:

Are added to the end of the frame which has already been transferred to the transmit RS buffer when the toggle bit is changed.

Procedure at the CANopen Side for Transmitting an RS Frame:

1. Break down the RS frame to be transmitted into sub-frames of max. 7 bytes each.

2. Transfer the sub-frames to the interface.

- Prepare the contents of the PDO to be transmitted:
 - Enter frame bytes of the sub-frame to be transmitted to PDO bytes 2 through max. 8.
 - PDO byte 1:
 - Enter “sub-frame length” (1 to 7).
 - Change the “toggle bit”.
 - Set the “end bit” to 1, if no additional sub-frames need to be transmitted.
- Transmit the PDO.
- Wait until the PDO has been transmitted.
- Wait an additional 5 ms (to allow the interface enough time to evaluate the PDO).
- Repeat the last 4 steps until all sub-frames have been transferred.

3. Wait until the RS frame has been transmitted:

- Transmission time depends upon frame length and the utilised RS baud rate (in this case: fixed 9600 Baud, 8n1)
 - = $1.3 \times \text{frame length} \times (10 \times 1/9600 \text{ s})$
 - = $1.3 \times \text{frame length} \times 1 \text{ ms}$
- * A safety factor of 1.3 must be used because the individual frame bytes cannot be transmitted entirely without pauses.
- Completion of frame transmission can also be detected by querying the “end bit” (via SDO). The end bit is changed to 0 as soon as the transmit buffer has been cleared, and the next frame can be transferred.

Important Notes:

- RS transmission operation is only possible in the CANopen “OPERATIONAL” state!
- After entering the “OPERATIONAL” state:
 - The transmit buffer is cleared (any previously accumulated sub-frames are deleted).
 - Any pending RS transmissions are completed first.
 - Object 2000_h, subindex 1 (function byte) is then deleted.
=> The toggle bit to be transmitted with the first sub-frame must be set to 1!
- The function byte is not evaluated during RS transmission. For this reason, it should not be changed until RS transmission has been completed.

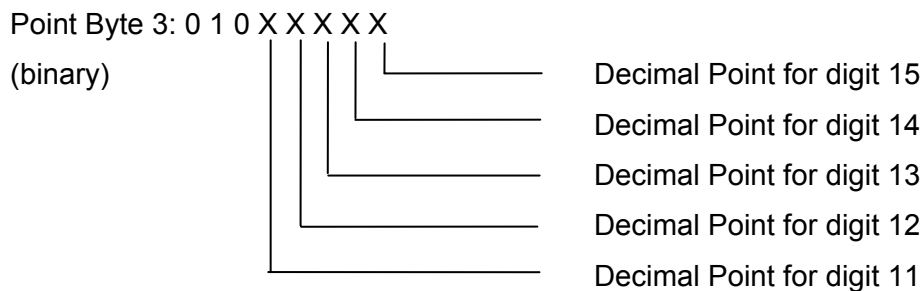
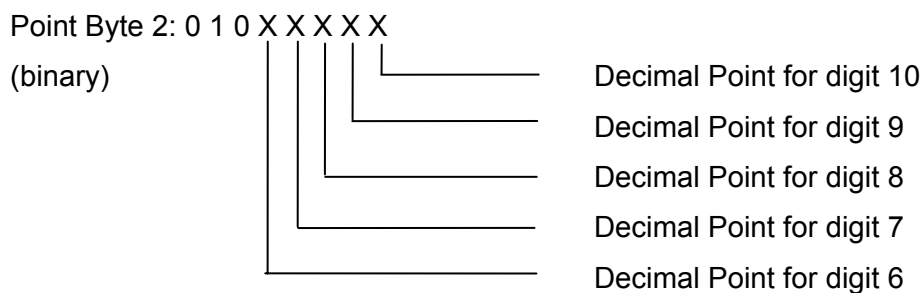
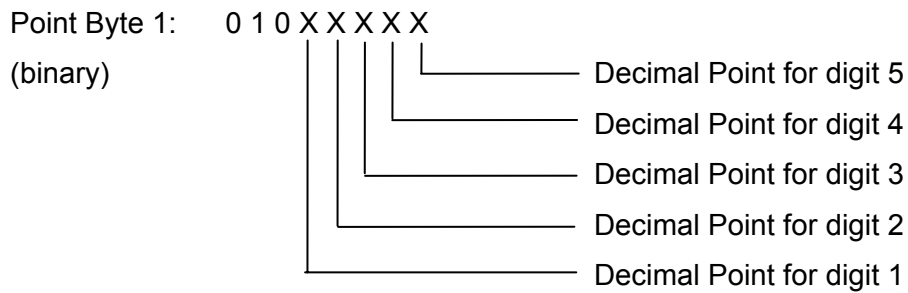
3.4 Internal frame (miface CAN -> MIGAN)

Frame (ASCII coded)							
	Header		DATA Unit				
Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6 to max. 20	Byte 21
STX	ADRH	ADRL	P1	P2	P3	DB 1-15	ETX

STX:	3C _H (fixed)
ADRH:	30 _H (fixed)
ADRL:	31 _H (fixed)
P1:	XX _H (decimal point byte 1 – see below)
P2:	XX _H (decimal point byte 2 – see below)
P3:	XX _H (decimal point byte 3 – see below)
DB 1-15:	Data bytes 1 to 15 (ASCII code of the characters to be displayed – max. 15 digits)
ETX:	3E _H (fixed)

Point Bytes:

If a decimal point needs to be set, the corresponding bit must be set to 1:



If no point shall be set, all point bytes have a value of 40H.

3.5 Applications Examples

Output “1234” at the display:

CANopen node ID: 01_h

MIGAN frame to be transmitted:

3C_h 30_h 31_h 40_h 40_h 40_h 31_h 32_h 33_h 34_h 3E_h

- Initialise the node (if it is not yet “OPERATIONAL”):
Transmit NMT frame (COB ID = 000_h): 01_h 01_h
- Transmit RPDO1 frame (COB-ID = 201_h): 17_h 3C_h 30_h 31_h 40_h 40_h 40_h 31_h
(last toggle bit was 0)
- Wait at least 5 ms.
- Transmit RPDO1 frame (COB-ID = 201_h): 84_h 32_h 33_h 34_h 3E_h 00_h 00_h 00_h
- Wait at least 5 ms.
- Wait for transmission of the MIGAN frame:
1.3 x 11 x 1 ms = 15 ms.

**Output “123456789012345” at the display
(is only displayed completely if using a MIGAN with 15 digits):**

CANopen node ID: 02_h

MIGAN frame to be transmitted:

3C_h 30_h 31_h 40_h 40_h 40_h 31_h 32_h 33_h 34_h 35_h 36_h 37_h 38_h 39_h 30_h 31_h 32_h 33_h 34_h 35_h 3E_h

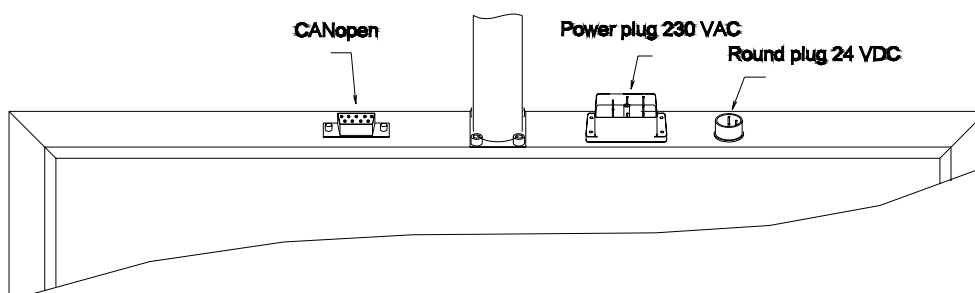
- Initialise the node (if it is not yet “OPERATIONAL”):
Transmit NMT frame (COB ID = 000_h): 01_h 02_h
- Transmit RPDO1 frame (COB-ID = 202_h): 17_h 3C_h 30_h 31_h 40_h 40_h 40_h 31_h
(last toggle bit was 0)
- Wait at least 5 ms.
- Transmit RPDO1 frame (COB-ID = 202_h): 07_h 32_h 33_h 34_h 35_h 36_h 37_h 38_h
- Wait at least 5 ms.
- Transmit RPDO1 frame (COB-ID = 202_h): 17_h 39_h 30_h 31_h 32_h 33_h 34_h 35_h
- Wait at least 5 ms
- Transmit RPDO1 frame (COB-ID = 202_h): 81_h 3E_h 00_h 00_h 00_h 00_h 00_h 00_h
- Wait at least 5 ms.
- Wait for transmission of the MIGAN frame:
1.3 x 22 x 1 ms = 30 ms.

3.5.1 Important Note

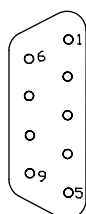
The CAN interface must be connected to an active CAN bus when it is switched on. A CAN error would otherwise occur when the boot-up message is transmitted.

4 Connection assignment

4.1 External connections



9pole Sub-D pin bar (CANopen)



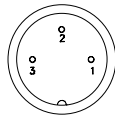
Pin	CANopen
1	n.c.
2	CAN L
3	CAN_GND
4	n.c.
5	CAN_Shield
6	GND
7	CAN_H
8	n.c.
9	n.c.

7 pole power plug (230 VAC)



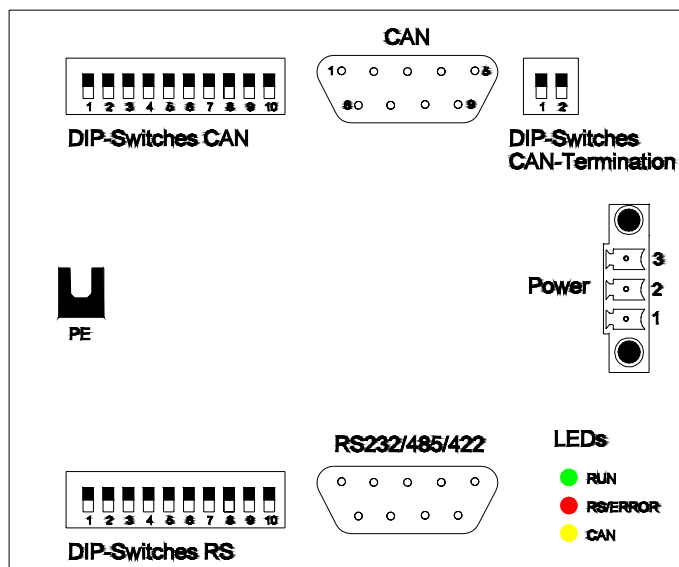
Pin	Assignment
1	L1
2	N
(PE)	PE

3 pole round plug (24 VDC, optional)



Pin	Assignment
1	GND
2	+24 VDC
3	PE

4.2 Status LEDs and DIP switches



Status LEDs:

LED	Status
RUN (green)	Normal operation: blinking
RS/ERROR (red)	RS communication: flickering Error: ON
CAN (yellow)	CAN frame received or transmitted => 100 ms ON

DIP Switches

DIP switch settings are specified below (0 = OFF and 1 = ON).
DIP switch settings are read in once only during power-up (after switching the device on).

Attention: Only change the settings of the described DIP switches! The other DIP switches are correctly adjusted by factory (see chapter 3.3)!

CAN Node ID:

DIP Switches CAN (S1)							CAN Node ID
DIP							
7	6	5	4	3	2	1	
0	0	0	0	0	0	1	1 _d
0	0	0	0	0	1	0	2 _d
0	0	0	0	0	1	1	3 _d
:							:
1	1	1	1	1	1	1	127 _d

Note: Only addresses 1 through 127 are permissible!

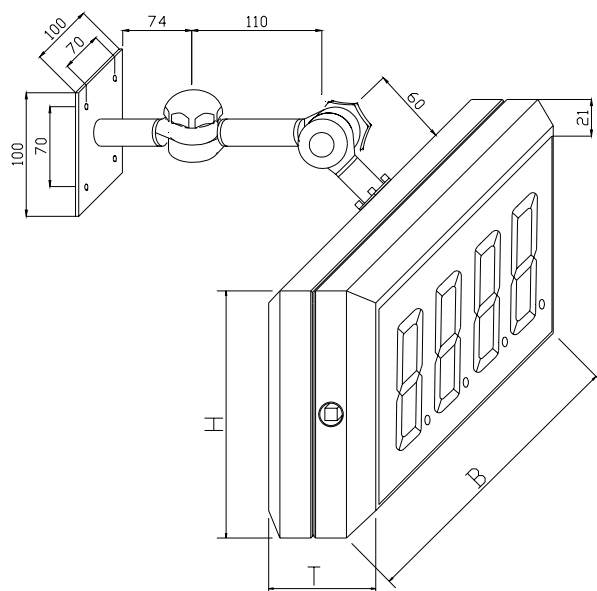
CAN Bit Rate:

DIP Switches CAN (S1)			CAN Bit Rate
DIP			
10	9	8	
0	0	0	1000 kBit/s
0	0	1	800 kBit/s
0	1	0	500 kBit/s
0	1	1	250 kBit/s
1	0	0	125 kBit/s
1	0	1	50 kBit/s
1	1	0	20 kBit/s
1	1	1	10 kBit/s

CAN Bus Termination:

DIP Switches CAN Termination		CAN Bus Termination
DIP		
1	2	
0	0	not terminated
1	1	terminated

5 Housing dimensions



mm:

Ziffernhöhe:	60 mm					100 mm					150 mm					200 mm					250 mm				
	B	1	2	3	T	B	1	2	3	T	B	1	2	3	T	B	1	2	3	T	B	1	2	3	T
2 Stellen:	305	202	238	338	87	305	202	345	488	87	368	238	418	597	87	440	338	618	898	87	620	338	618	898	87
3 Stellen:	305	202	238	338	87	440	202	345	488	87	440	238	418	597	87	620	338	618	898	87	720	338	618	898	87
4 Stellen:	305	202	238	338	87	440	202	345	488	87	620	238	418	597	87	720	338	618	898	87	920	338	618	898	87
5 Stellen:	440	202	238	338	87	620	202	345	488	87	720	238	418	597	87	920	338	618	898	87	1080	338	618	898	87
6 Stellen:	440	202	238	338	87	620	202	345	488	87	820	238	418	597	87	1080	338	618	898	87	1298	338	618	898	87
7 Stellen:	440	202	238	338	87	720	202	345	488	87	920	238	418	597	87	1218	338	618	898	87	1559	338	618	898	87
8 Stellen:	620	202	238	338	87	820	202	345	488	87	1080	238	418	597	87	1378	338	618	898	87	1698	338	618	898	87
9 Stellen:	620	202	238	338	87	920	202	345	488	87	1180	238	418	597	87	1559	338	618	898	87	1898	338	618	898	87
10 Stellen:	620	202	238	338	87	1080	202	345	488	87	1298	238	418	597	87	1698	338	618	898	87	2098	338	618	898	87
11 Stellen:	620	202	238	338	87	1080	202	345	488	87	1559	238	418	597	87	1858	338	618	898	87	2298	338	618	898	87
12 Stellen:	720	202	238	338	87	1180	202	345	488	87	1559	238	418	597	87	2047	338	618	898	87	2498	338	618	898	87
13 Stellen:	720	202	238	338	87	1360	202	345	488	87	1658	238	418	597	87	2178	338	618	898	87	2698	338	618	898	87
14 Stellen:	820	202	238	338	87	1360	202	345	488	87	1778	238	418	597	87	2338	338	618	898	87	2898	338	618	898	87

inches:

Char. height:	2,36"					3,94"					5,91"					7,87"					9,84"				
	B	1	2	3	T	B	1	2	3	T	B	1	2	3	T	B	1	2	3	T	B	1	2	3	T
2 Digits:	12	7,95	9,37	13,3	3,43	12	7,95	13,6	19,2	3,43	14,5	9,37	16,5	23,5	3,43	17,3	13,3	24,3	35,4	3,43	24,4	13,3	24,3	35,4	3,43
3 Digits:	12	7,95	9,37	13,3	3,43	17,3	7,95	13,6	19,2	3,43	17,3	9,37	16,5	23,5	3,43	24,4	13,3	24,3	35,4	3,43	28,4	13,3	24,3	35,4	3,43
4 Digits:	12	7,95	9,37	13,3	3,43	17,3	7,95	13,6	19,2	3,43	24,4	9,37	16,5	23,5	3,43	28,4	13,3	24,3	35,4	3,43	36,2	13,3	24,3	35,4	3,43
5 Digits:	17,3	7,95	9,37	13,3	3,43	24,4	7,95	13,6	19,2	3,43	28,4	9,37	16,5	23,5	3,43	36,2	13,3	24,3	35,4	3,43	42,5	13,3	24,3	35,4	3,43
6 Digits:	17,3	7,95	9,37	13,3	3,43	24,4	7,95	13,6	19,2	3,43	32,3	9,37	16,5	23,5	3,43	42,5	13,3	24,3	35,4	3,43	51,1	13,3	24,3	35,4	3,43
7 Digits:	17,3	7,95	9,37	13,3	3,43	28,4	7,95	13,6	19,2	3,43	36,2	9,37	16,5	23,5	3,43	48	13,3	24,3	35,4	3,43	61,4	13,3	24,3	35,4	3,43
8 Digits:	24,4	7,95	9,37	13,3	3,43	32,3	7,95	13,6	19,2	3,43	42,5	9,37	16,5	23,5	3,43	54,3	13,3	24,3	35,4	3,43	66,9	13,3	24,3	35,4	3,43
9 Digits:	24,4	7,95	9,37	13,3	3,43	36,2	7,95	13,6	19,2	3,43	46,5	9,37	16,5	23,5	3,43	61,4	13,3	24,3	35,4	3,43	74,7	13,3	24,3	35,4	3,43
10 Digits:	24,4	7,95	9,37	13,3	3,43	42,5	7,95	13,6	19,2	3,43	51,1	9,37	16,5	23,5	3,43	66,9	13,3	24,3	35,4	3,43	82,6	13,3	24,3	35,4	3,43
11 Digits:	24,4	7,95	9,37	13,3	3,43	42,5	7,95	13,6	19,2	3,43	61,4	9,37	16,5	23,5	3,43	73,2	13,3	24,3	35,4	3,43	90,5	13,3	24,3	35,4	3,43
12 Digits:	28,4	7,95	9,37	13,3	3,43	46,5	7,95	13,6	19,2	3,43	61,4	9,37	16,5	23,5	3,43	80,6	13,3	24,3	35,4	3,43	98,4	13,3	24,3	35,4	3,43
13 Digits:	28,4	7,95	9,37	13,3	3,43	53,5	7,95	13,6	19,2	3,43	65,3	9,37	16,5	23,5	3,43	85,8	13,3	24,3	35,4	3,43	106	13,3	24,3	35,4	3,43
14 Digits:	32,3	7,95	9,37	13,3	3,43	53,5	7,95	13,6	19,2	3,43	70	9,37	16,5	23,5	3,43	92,1	13,3	24,3	35,4	3,43	114	13,3	24,3	35,4	3,43

6 Appendix

6.1 Standard equipment

- Display in current SW and HW version
- Square socket key
- User manual
- Mating plug
- EDS file on disk

6.2 Optional accessories

- Square socket key
- User manual DIN A4

6.3 Displayable characters

The data bytes are ASCII coded:

Lower P	Higher P	0000 0	0001 1	0010 2	0011 3	0100 4	0101 5	0110 6	0111 7
0000	0			"Blank"	0		P		P
0001	1				1	A	9	A	9
0010	2				2	b	r	b	r
0011	3				3	c	S	c	S
0100	4				4	d	E	d	E
0101	5				5	E	u	E	u
0110	6				6	F		F	
0111	7				7	G		G	
1000	8			C	8	H		H	
1001	9			J	9	I	Y	I	Y
1010	A					J		J	
1011	B								
1100	C					L		L	
1101	D			-					
1110	E					n		n	
1111	F					o	-	o	

6.4 General notes

Please note the following:

- When installing the device, always make sure that the installed housing can be opened for adjustment or maintenance work. When attaching the device, leave an appropriate space on the back / front / top to ensure adequate ventilation (if available).
- Direct exposure to light sources or direct sun rays reduces the reading quality.
- Turn the device off for cleaning.
- Protect the device from excessive moisture, strong vibrations, direct sun exposure and extreme temperatures. If this is not observed, it can cause function problems or device destruction. In addition, there is the danger of electric shock, fire or explosion. Please refer to "Technical Information" chapter for detailed information regarding proper ambient conditions, especially recommended temperature ranges.
- The device may not be used if there is any damage on the device and / or power line.
- Do not attempt to repair the device yourself. Any interference by unauthorized personnel will void the warranty.

6.5 Conformity declaration

microSYST Systemelectronic GmbH, Zur Centralwerkstätte 10,
92637 Weiden, Germany

does hereby declare that the product described in this user's manual,

“migan CAN”

to which this declaration makes due reference,
is in compliance with the following standards or normative documents:

Interference emission: generic standard EN 50081 - 2, issued July 1993
Product standard: EN 55011; group 1/2; class A, issued March 1991
Limit values identical to EN 55022

Interference immunity: generic standard EN 50082 - 2, issued March 1995
Basic specification per table

In accordance with regulations specified by guideline 89/336/ EWG (and
EMVG).

Weiden, 1 March 2004

microSYST Systemelectronic GmbH

6.6 Guarantee

For the delivered device, we assume liability for any existing defects at delivery within the warranty period, as required by law.

Technical changes as well as errors excepted. Entitlement to delivery of a new product does not exist. The purchaser must report any defects within 2 weeks after recognition of the defect. In case of violation of reproval, the affected defect is considered to be approved.

Generally, any defects or their symptoms must be described in detail to ensure reproducibility and therefore any remedy. The purchaser must provide - free of charge - any required and / or relevant information to remedy the defect, provide access to the device and data in question, and also provide the required data and machine time free of charge.

The warranty does not include defects, which were caused by failure to comply with the required operating conditions or improper handling.

If the product has been left for test purposes and was then purchased, the parties agree that the product has been transferred as "used", as far as the law is concerned, and has been taken over "as tested". In this case any warranty claims are excluded.

Additionally, the "General delivery conditions" for products and service in the electrical industry apply.

6.7 Versions overview

Ver.	Date	Remarks, Description
1.00	14.03.01	Rass
1.10	12.12.01	Kreuzer: Font size changed
1.20	19.12.01	Kreuzer: Housing sizes changed
1.30	04.02.02	Nickl: Completely revised
1.40	11.11.02	Kreuzer: New logo
1.50	15.07.03	Kreuzer: "Displayable characters" changed
1.60	14.10.03	Kreuzer: Notes for the start-up
2.00	16.03.04	Kreuzer, Nickl: New CAN interface